WHAT IS CLAIMED IS:

1. A method for compensating for streak defects in an image formed using an image forming device that forms the image on a receiving material that is translated through the image forming device along a process direction, comprising:

printing a compensation pattern usable to determine a difference in gray level between an actual gray level value and an intended gray level value at a cross-process-direction image-forming device pixel location in the image, comprising:

printing a plurality of gray level portions, each gray level portion having a gray level that is different from the other gray level portions and extending along the cross-process-direction, the plurality of gray level portions arranged along the process direction,

printing a first set of alignment marks adjacent to a first end of the plurality of gray level portions, the first set of alignment marks having at least one row of marks extending along the cross-process-direction, and

printing a second set of alignment marks adjacent to a second end of the plurality of gray level portions, the second set of alignment marks having at least one row of marks extending along the cross-process-direction;

scanning the compensation pattern to generate a set of scanned image data, the scanned image data defining an image value for each of a plurality of cross-process direction scanned image pixel locations;

analyzing the scanned image data based on the cross-process direction scanned image pixel locations of the marks of the first and second sets of alignment marks to determine at least one actual gray level value for at least one of the plurality of gray level portions for at least one cross-process-direction image-forming device pixel location;

generating, for each analyzed cross-process-direction image-forming device pixel location, for each analyzed gray level portion of that analyzed cross-process-direction image-forming device pixel location, a compensation parameter based on the determined actual gray level value for that analyzed gray level portion and the intended gray level value for that analyzed gray level portion.

2. The method of claim 1, wherein:

printing the first set of alignment marks adjacent to the first end of the plurality of gray level portions comprises printing a plurality of rows of marks

extending along the cross-process-direction such that the marks of each row are offset from the marks of other ones of the plurality of rows of the first set and, for each row, each mark of that row is spaced apart from adjacent marks of that row by a number of cross-process-direction image-forming device pixel location at least equal to the number of the plurality of rows of the first set; and

printing the second set of alignment marks adjacent to the second end of the plurality of gray level portions comprises printing a plurality of rows of marks extending along the cross-process-direction such that the marks of each row are offset from the marks of other ones of the plurality of rows of the second set and, for each row, each mark of that row is spaced apart from adjacent marks of that row by a number of cross-process-direction image-forming device pixel location at least equal to the number of the plurality of rows of the second set.

3. The method of claim 2, wherein:

for each mark of the first set of marks, that mark is associated with a particular cross-process-direction image-forming device pixel location; and

for each mark of the second set of marks, that mark is associated with a particular cross-process-direction image-forming device pixel location and corresponds with the mark of first set of marks that is associated with that particular cross-process-direction image-forming device pixel location.

4. The method of claim 1, wherein analyzing the scanned image data based on the scanned image pixel locations of the marks of the first and second sets of alignment marks to determine at least one actual gray level value for at least one of the plurality of gray level portions for at least one cross-process-direction image-forming device pixel location comprises:

selecting one of the cross-process direction scanned image pixel locations as a current cross-process direction scanned image pixel location; and

determining, for each of the first and second sets of alignment marks that are associated with the current cross-process direction scanned image pixel location, at least one of a width of that alignment mark and a centroid of that alignment mark;

selecting one of the gray level portions as a current gray level portion and

determining, for the cross-process-direction image-forming device pixel location associated the selected cross-process direction scanned image pixel location, the actual gray level value for the selected gray level portion of the associated cross-process-direction image-forming device pixel location based on the at least one of the determined widths and the determined centroids of the first and second associated alignment marks.

5. The method of claim 4, wherein analyzing the scanned image data further comprises repeating the gray level portion selecting and actual gray level determining steps for each of the plurality of gray level portions.

6. The method of claim 5, wherein analyzing the scanned image data further comprises repeating the cross-process direction scanned image pixel location selecting and width determining steps for each of the plurality of cross-process direction scanned image pixel locations.

7. The method of claim 4, wherein generating, for each analyzed cross-process-direction image-forming device pixel location, for each analyzed gray level portion of that analyzed cross-process-direction image-forming device pixel location, a compensation parameter based on the determined actual gray level value for that analyzed gray level portion and the intended gray level value for that analyzed gray level portion comprises generating the compensation value for that cross-process-direction image-forming device pixel location based on the determined actual gray level value for that gray level portion of the corresponding scanned image pixel location and the intended gray level value for that gray level portion.

8. The method of claim 4, wherein :

determining, for each of the first and second sets of alignment marks that are associated with the current scanned image pixel location, a width of that alignment mark comprises:

determining, for that alignment mark, an average gray level value for each cross-process direction scanner pixel location of that alignment mark along the cross-process direction,

developing an intensity vs. cross process position curve, and

identifying each side of that alignment mark along the cross-process direction based on the intensity vs. cross process position curve and a determined threshold value; and

determining, for each of the first and second sets of alignment marks that are associated with the current cross-process direction scanned image pixel location, a centroid of that alignment mark comprises:

determining a maximum value on the intensity vs. cross process position curve as the centroid of each alignment mark.

9. The method of claim 8, where determining, for the cross-process-direction image-forming device pixel location associated the selected scanned image pixel location, the actual gray level value for the selected gray level portion of the associated cross-process-direction image-forming device pixel location based on the at least one of the determined widths and the determined centroids of the first and second associated alignment marks comprises determining the cross-position process-direction image-forming device pixel location that is associated with the selected scanned image pixel location based on the locations of the determined centroids of the first and second associated alignment marks.

10. The method of claim 9, where determining, for the cross-process-direction image-forming device pixel location associated the selected scanned image pixel location, the actual gray level value for the selected gray level portion of the associated cross-process-direction image-forming device pixel location based on the at least one of the determined widths and the determined centroids of the first and second associated alignment marks comprises

identifying, based on the determined widths and centroids of the associated first and second alignment marks, the scanned image data pixels of the selected gray level portion; and

averaging the gray level values of the identified scanned image data pixels to generate the actual gray level value for the selected gray level portion

11. The method of claim 1, wherein generating, for each analyzed cross-process-direction image-forming device pixel location, for each analyzed gray level portion of that analyzed cross-process-direction image-forming device pixel location, a compensation parameter based on the determined actual gray level value for that analyzed gray level portion and the intended gray level value for that analyzed gray level portion comprises generating a local tone reproduction curve value for that analyzed gray level value and for that analyzed cross-process-direction image-forming device pixel location that is usable in place of a generalized tone

reproduction curve value for the image device, to convert input image data into printable image data such that the actual gray level value that is printed for that cross-process-direction image-forming device pixel location is substantially equivalent to the intended gray level value.

12. The method of claim 11, further comprising generating a local tone reproduction curve that provides a compensation parameter for each possible intended gray level value for that analyzed cross-process-direction image-forming device pixel location.

13. The method of claim 12, wherein generating a local toner reproduction curve comprises determining compensation parameters for each possible intended gray level value based on the determined compensation parameters for the plurality of actual gray level portions.

14. The method of claim 13, wherein determining compensation parameters for each possible intended gray level value comprises interpolating between the determined compensation parameters for the plurality of actual gray level portions for intended gray level values that lie between the gray level values of adjacent ones of the plurality of actual gray level portions.

15. The method of claim 1, further comprising:

correlating determined line widths of each alignment mark to the gray level values of the gray level portions and the associated compensation parameters.

16. The method of claim 15, further comprising:

printing another copy of at least one of the first and second sets of alighnment marks of the compensation patterns;

measuring the line widths of the alignment marks of the another copy of the compensation pattern; and

if a line width of any alignment mark has changed in the another copy of the compensation pattern relative to a width of that alignment mark in the first copy of the compensation pattern, selecting new compensation parameters for each cross-process-direction image-forming device pixel location associated with the alignment marks whose width changed based on a correlation relating the determined line width to compensation parameter for that alignment mark.

17. A compensation pattern usable to determine a difference in gray level between an actual gray level value and an intended gray level value at a cross-

process-direction image-forming device pixel location in an image formed using an image forming device, comprising:

a plurality of gray level portions, each gray level portion having a gray level that is different from the other gray level portions and extending over a plurality of cross-process-direction pixel locations along the cross-process-direction, the plurality of gray level portions arranged along the process direction,

a first set of alignment marks adjacent to a first end of the plurality of gray level portions, the first set of alignment marks having at least one row of marks extending along the cross-process-direction, and

a second set of alignment marks adjacent to a second end of the plurality of gray level portions, the second set of alignment marks having at least one row of marks extending along the cross-process-direction.

18. The compensation pattern of claim 17, wherein each alignment mark of the first and second sets of alignment marks is associated with one of the cross-process-direction pixel locations and is usable both to correlate that cross-process-direction image forming device pixel location with a corresponding cross-process-direction scanned image pixel location within a scanned image of the compensation pattern formed using the image forming device and to determine changes in gray level between an actual gray level value and an intended gray level value at that cross-process-direction image-forming device pixel location based on a measured width of that alignment mark

19. A storage medium storing a set of program instructions executable on a data processing device and usable to create data for compensating for streak defects in an image formed using an image forming device that forms the image on a receiving material that is translated through the image forming device along a process direction, the set of program instructions comprising:

instructions for printing a compensation pattern usable to determine a difference in gray level between an actual gray level value and an intended gray level value at a cross-process-direction image-forming device pixel location in the image, comprising:

instructions for printing a plurality of gray level portions, each gray level portion having a gray level that is different from the other gray level

portions and extending along the cross-process-direction, the plurality of gray level portions arranged along the process direction,

instructions for printing a first set of alignment marks adjacent to a first end of the plurality of gray level portions, the first set of alignment marks having at least one row of marks extending along the cross-process-direction, and

instructions for printing a second set of alignment marks adjacent to a second end of the plurality of gray level portions, the second set of alignment marks having at least one row of marks extending along the cross-process-direction;

instructions for scanning the compensation pattern to generate a set of scanned image data, the scanned image data defining an image value for each of a plurality of cross-process direction scanned image pixel locations;

instructions for analyzing the scanned image data based on the cross-process direction scanned image pixel locations of the marks of the first and second sets of alignment marks to determine at least one actual gray level value for at least one of the plurality of gray level portions for at least one cross-process-direction image-forming device pixel location;

instructions for generating, for each analyzed cross-process-direction image-forming device pixel location, for each analyzed gray level portion of that analyzed cross-process-direction image-forming device pixel location, a compensation parameter based on the determined actual gray level value for that analyzed gray level portion and the intended gray level value for that analyzed gray level portion.

20. The storage medium of claim 19, wherein:

the instructions for printing the first set of alignment marks adjacent to the first end of the plurality of gray level portions comprise instructions for printing a plurality of rows of marks extending along the cross-process-direction such that the marks of each row are offset from the marks of other ones of the plurality of rows of the first set and, for each row, each mark of that row is spaced apart from adjacent marks of that row by a number of cross-process-direction image-forming device pixel location at least equal to the number of the plurality of rows of the first set; and

the instructions for printing the second set of alignment marks adjacent to the second end of the plurality of gray level portions comprise instructions for

printing a plurality of rows of marks extending along the cross-process-direction such that the marks of each row are offset from the marks of other ones of the plurality of rows of the second set and, for each row, each mark of that row is spaced apart from adjacent marks of that row by a number of cross-process-direction image-forming device pixel location at least equal to the number of the plurality of rows of the second set.

21. The storage medium of claim 20, wherein:

for each mark of the first set of marks, that mark is associated with a particular cross-process-direction image-forming device pixel location; and

for each mark of the second set of marks, that mark is associated with a particular cross-process-direction image-forming device pixel location and corresponds with the mark of first set of marks that is associated with that particular cross-process-direction image-forming device pixel location.

22. The storage medium of claim 19, wherein the instructions for analyzing the scanned image data based on the scanned image pixel locations of the marks of the first and second sets of alignment marks to determine at least one actual gray level value for at least one of the plurality of gray level portions for at least one cross-process-direction image-forming device pixel location comprise:

instructions for selecting one of the cross-process direction scanned image pixel locations as a current cross-process direction scanned image pixel location;

instructions for determining, for each of the first and second sets of alignment marks that are associated with the current cross-process direction scanned image pixel location, at least one of a width of that alignment mark and a centroid of that alignment mark;

instructions for selecting one of the gray level portions as a current gray level portion and

instructions for determining, for the cross-process-direction image-forming device pixel location associated the selected cross-process direction scanned image pixel location, the actual gray level value for the selected gray level portion of the associated cross-process-direction image-forming device pixel location based on the at least one of the determined widths and the determined centroids of the first and second associated alignment marks.

23. The storage medium of claim 22, wherein the instructions for analyzing the scanned image data further comprise instructions for repeating the gray level portion selecting and actual gray level determining steps for each of the plurality of gray level portions.

24. The storage medium of claim 23, wherein the instructions for analyzing the scanned image data further comprise instructions for repeating the cross-process direction scanned image pixel location selecting and width determining instructions for each of the plurality of cross-process direction scanned image pixel locations.

25. The storage medium of claim 22, wherein the instructions for generating, for each analyzed cross-process-direction image-forming device pixel location, for each analyzed gray level portion of that analyzed cross-process-direction image-forming device pixel location, a compensation parameter based on the determined actual gray level value for that analyzed gray level portion and the intended gray level value for that analyzed gray level portion comprise instructions for generating the compensation value for that cross-process-direction image-forming device pixel location based on the determined actual gray level value for that gray level portion of the corresponding scanned image pixel location and the intended gray level value for that gray level portion.

26. The storage medium of claim 22, wherein:

the instructions for determining, for each of the first and second sets of alignment marks that are associated with the current scanned image pixel location, a width of that alignment mark comprise:

instructions for determining, for that alignment mark, an average gray level value for each cross-process direction scanner pixel location of that alignment mark along the cross-process direction,

instructions for developing an intensity vs. cross process position curve, and

instructions for identifying each side of that alignment mark along the cross-process direction based on the intensity vs. cross process position curve and a determined threshold value; and

the instructions for determining, for each of the first and second sets of alignment marks that are associated with the current cross-process direction scanned image pixel location, a centroid of that alignment mark comprise:

instructions for determining a maximum value on the intensity vs. cross process position curve as the centroid of each alignment mark.

27. The storage medium of claim 26, where the instructions for determining, for the cross-process-direction image-forming device pixel location associated the selected scanned image pixel location, the actual gray level value for the selected gray level portion of the associated cross-process-direction image-forming device pixel location based on the at least one of the determined widths and the determined centroids of the first and second associated alignment marks comprise instructions for determining the cross-position process-direction image-forming device pixel location that is associated with the selected scanned image pixel location based on the locations of the determined centroids of the first and second associated alignment marks.

28. The storage medium of claim 27, where the instructions for determining, for the cross-process-direction image-forming device pixel location associated the selected scanned image pixel location, the actual gray level value for the selected gray level portion of the associated cross-process-direction image-forming device pixel location based on the at least one of the determined widths and the determined centroids of the first and second associated alignment marks comprise:

instructions for identifying, based on the determined widths and centroids of the associated first and second alignment marks, the scanned image data pixels of the selected gray level portion; and

instructions for averaging the gray level values of the identified scanned image data pixels to generate the actual gray level value for the selected gray level portion

29. The storage medium of claim 19, wherein the instructions for generating, for each analyzed cross-process-direction image-forming device pixel location, for each analyzed gray level portion of that analyzed cross-process-direction image-forming device pixel location, a compensation parameter based on the determined actual gray level value for that analyzed gray level portion and the intended gray level value for that analyzed gray level portion comprise instructions

for generating a local toner reproduction curve value for that analyzed gray level value and for that analyzed cross-process-direction image-forming device pixel location that is usable in place of a generalized toner reproduction curve value for the image device, to convert input image data into printable image data such that the actual gray level value that is printed for that cross-process-direction image-forming device pixel location is substantially equivalent to the intended gray level value.

30. The storage medium of claim 29, further comprising instructions for generating a local toner reproduction curve that provides a compensation parameter for each possible intended gray level value for that analyzed cross-process-direction image-forming device pixel location.

31. The storage medium of claim 30, wherein the instructions for generating a local toner reproduction curve comprise instructions for determining compensation parameters for each possible intended gray level value based on the determined compensation parameters for the plurality of actual gray level portions.

32. The storage medium of claim 31, wherein the instructions for determining compensation parameters for each possible intended gray level value comprise instructions for interpolating between the determined compensation parameters for the plurality of actual gray level portions for intended gray level values that lie between the gray level values of adjacent ones of the plurality of actual gray level portions.

33. The storage medium of claim 19, further comprising instructions for correlating determined line widths of each alignment mark to the gray level values of the gray level portions and the associated compensation parameters.

34. The storage medium of claim 34, further comprising:

instructions for printing another copy of at least one of the first and second sets of alighnment marks of the compensation patterns;

instructions for measuring the line widths of the alignment marks of the another copy of the compensation pattern; and

instructions for selecting, if a line width of any alignment mark has changed in the another copy of the compensation pattern relative to a width of that alignment mark in the first copy of the compensation pattern, new compensation parameters for each cross-process-direction image-forming device pixel location

associated with the alignment marks whose width changed based on a correlation relating the determined line width to compensation parameter for that alignment mark.